KALIN ... VA, ... : ... NIBV, N.N.

Thrombocytopoiesis in hypoplastic and aplastic anaemias in children.
Vop. gemat. v pediat. no.3:174-181 '64.

(MIRA 18:7)

AKOL'ZIN, L.Ye.; BEDILO, V.Ye.; BOROZDOV, I.A.; VINARSKIY, I.S.;
GOLOVATYUK, S.A.; NIKOLAYEV, G.P. Prinimali uchastiye:
DATSUN, N.V.; ZHEGOV, V.T.; IVANITSKAYA, S.Yu.; KOMISSAROV,
M.A.; KALINCHUK, I.G.; LISHBERGOV, V.D.; SEREBRENNIKOVA, S.O.;
FILIN, V.D. DUGIN, Ye.V., otv.red.; DUKALOV, M.F., red.;
BUBYR', V.A., red.; TYUTYUNIK, Ya.I., red.; VARSHAVSKIY, I.N.,
red.; MONIN, M.I., red.; PANCHENKO, A.I., red.; BELYAYEV, F.R.,
red.; RABINKOVA, L.K., red.izd-va; BOLDYREVA, Z.L., tekhn.red.

[Types of mine cross section] Tipovye secheniia gornykh vyrabo-
tok. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu.
Vol.5. [Cross section of mines with reinforced-concrete supports
and hinge-hung crossbars for 1-, 2- and 3-ton railroad cars]
Secheniia vyrabotok, zakreplennykh zhelezobetonnymi stoikami
s sharnirno-podvesnym vekhniakom, dlia 1-, 2- i 3-tonnykh
vagonetok. 1960. 411 p.   (MIRA 13:12)

1. Khar'kov. Gosudarstvennyy proyektnyy institut Yuzhgiproshekht.
       (Mine timbering)

1. KALINICIUK, YE. ...: PASUTSKIY, A.YU.: DAVIDSKIY, A.L. ...G

2. USSR (600)

4. Gums and Resins

7. Accelerating the method for producing glycerin ether of rosin. Der. i lesokhim. prom. 1 no. 5 1952
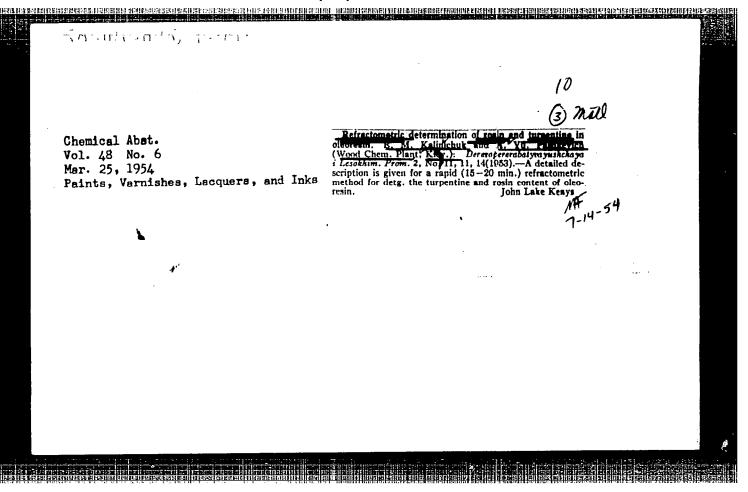
9. **Monthly** **List** **of** **Russian** **Accessions**, Library of Congress March 1953. Unclassified.

KALINICHUK, Ye.M.; MEYZIKOVA, A.Ye.

Rapid method for detection of water in turpentine. Ukrain. Khim. Zhur. 18,
76-81 '52.
(CA 47 no.22:12835 '53)

                                               (MLRA 6:4)

KALINICHUK, E.M.

Chem Abs v48
1 - 25 - 54
Paints, Varnishes,
Lacquers, & Inks

Determination of the contaminant content of oleoresin. E. M. Kalinichuk and A. Yu. Pashkevich (Kiev Wood Chem. Plant). *Derevopererabatyvayushchaya i Lesokhim. Prom.* 2, No. 7, 11-13(1953).—App. and method are described for detg. the vol. of contaminants (I) in oleoresin (II). The equation $C = 25 V/T$, where C (± 0.01 g.) = wt. % anhyd. nonresinous I in II, V = vol. of I detd. by the method given, and T = wt. of II in g. was found valid for the samples of II studied.   John Lake Keays

MF
7-13-54

10

(3) mill

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Paints, Varnishes, Lacquers, and Inks

Refractometric determination of rosin and turpentine in oleoresin. B. M. Kalinichuk and A. Yu. Filippova (Wood Chem. Plant, Kiev). *Derevopererabatyvayushchaya i Lesokhim. Prom.* 2, No. 11, 11, 14(1953).—A detailed description is given for a rapid (15–20 min.) refractometric method for detg. the turpentine and rosin content of oleoresin.
John Lake Keays

7-14-54

VASIL'YEVA, N.G., dotsent; ANDRONIK, N.D., ispolnyayushchiy obyazannosti
        assistenta; KALINIK, A.A., ordinator

Osteosynthesis in fractures of the mandible using periosteal
plexigals plates. Trudy Nauch.-issl.inst.stom. no.10:63-71 '62.
                                                    (MIRA 15:10)
        (JAWS—FRACTURE)   (PLASTICS IN MEDICINE)

KALININ, A.A.; KABANOVA, G.B.; KIRILLOV, I.P.

Relation between the catalytic activity of phosphate catalyst, and the conditions of their preparation. Izv, vys. ucheb. zav.; khim. i khim. tekh. 8 no.1:88-93 '65.   (MIRA 18:6)

1. Ivanovskiy khimiko-tekhnologicheskiy institut, kafedra tekhnologii neorganicheskikh veshchestv.

KALINIK, Vyacheslav Pavlovich; SHAMOV, Aleksandr Vasil'yevich; PETROV,
M.D., redaktor; VYSOTA, I.I., retsenzent; FEDOROV, V.B., retsen-
zent; KAN, P.M., redaktor; KRASNAYA, A.K., tekhnicheskiy redaktor.

[Training manual for marine boiler tenders] Posobie dlia podgoto-
vki sudovykh kochegarov. Moskva, Izd-vo "Rechnoi transport,"
1955. 163 p.   (MLRA 8:10)
          (Boilers, Marine)

KALINIKOS A.I.

BLYUMBERG, I.B.; ARTSISHEVSKIY, Ye.P.; KALINIKOS, A.I.

Improvement of developing systems. Trudy LIKI no.3:193-196 '55.
(MLRA 9:8)

1. Kafedra obshchey fotografii i tekhnologii obrabotki kinofotomaterialov.

(Cinematography--Developing and developers)

KALININ, A.; KOVALEVSKAYA, L.

Rotation of Crops

Adopting grass and field crop rotation. Kolk. proizv., 12, No. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, June 1952. UNCLASSIFIED.

KALININ, A.

"Stratification of tree seeds under natural conditions, Tr. From the Russian." p. 317.
(Gorsko Stopanstvo. Vol. 9, no. 7, Sept. 1953. Sofiya.)

SO: Monthly List of ~~Russian~~ East European Accessions, Library of Congress,   June   1953, Uncl. Vol. 3, No. 6

KALININ, A. (g.Kursk)

Our fruitful group work. Kryl.rod. 11 no.2:11 F '60.

(MIRA 13:6)
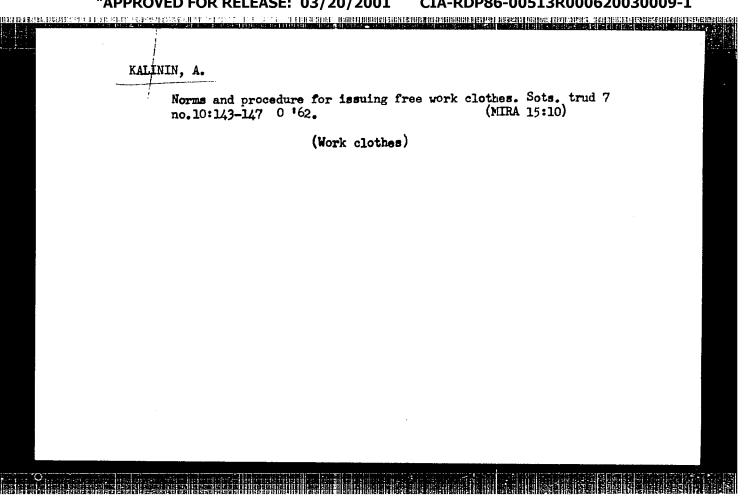
(Kursk--Aeronautics)
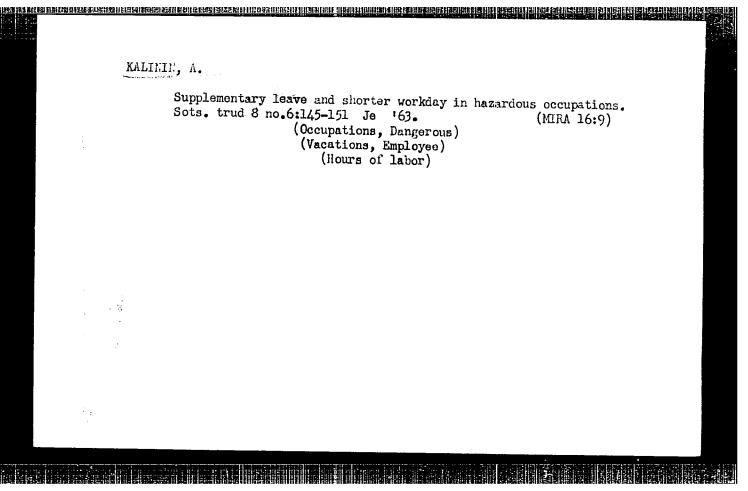
KALININ, A., mayor, voyennyy shturman pervogo klassa

Determining the deflection angle if the antenna has been stopped.
Av.i kosm. 44 no.3:87-88 '62.   (MIRA 15:3)
                    (Radio direction finders)

KALININ, A.

Norms and procedure for issuing free work clothes. Sots. trud 7
no.10:143-147 O '62.   (MIRA 15:10)

(Work clothes)

KALININ, A.

Supplementary leave and shorter workday in hazardous occupations.
Sots. trud 8 no.6:145-151   Je '63.   (MIRA 16:9)
                    (Occupations, Dangerous)
                    (Vacations, Employee)
                        (Hours of labor)

KALININ, A. (poselok Mel'nichnyy Ruchey, Leningradskoy obl.); POPKOV, V.,
     inzh. (Khar'kov); PERETS, P. (Bronnitsy, Moskovskoy obl.);
     KUZNETSOV, P. (Leningrad); MATVEYENKO, I., mekhanik (Alatyr');
     KALINICHENKO, M. (Leningrad); IKKERT, G. (Otradnyy, Kuybyshevskoy
     obl.); DUDIKOV, N.; BUKANOV, A.

     Readers suggest. Za rul. 21 no.7:18-19 Jl '63.   (MIRA 16:8)
               (Motor vehicles--Technological innovations)

LOBANOV, I.A.; KALININ, A.A.

Manually operated tool for making corrugated/steel ventilation
outlets. Rats. i izobr. predl. v stroi. no.7:110-112 '58.

(MIRA 11:12)

1.Zavod No.4 tresta Santekhmontazh, Leningrad.
(Ventilation)

KIRILLOV, I.P.; KALININ, A.A.

Thermal stability of phosphate catalysts for vapor-phase
hydration of cetylene. Izv. vys. ucheb. zav., khim i khim.
tekh. 7 no.5:801-805 '64

(MIRA 18:1)

1. Kafedra tekhnologii neorganicheskikh veshchestv Ivanovskogo
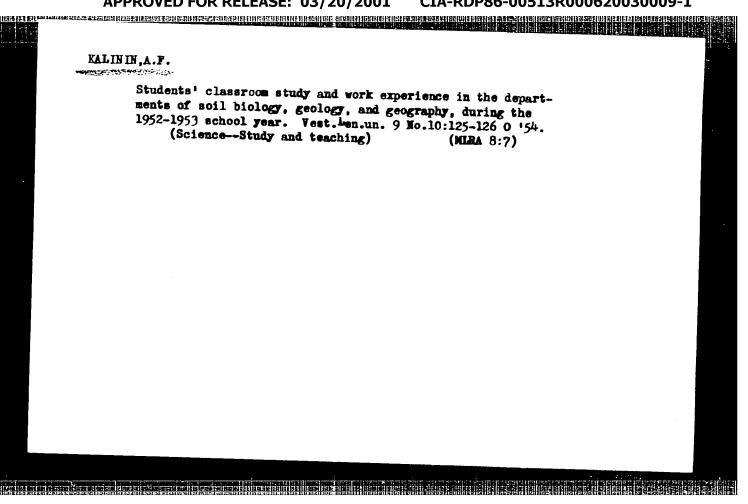khimiko tekhnologicheskogo instituta.
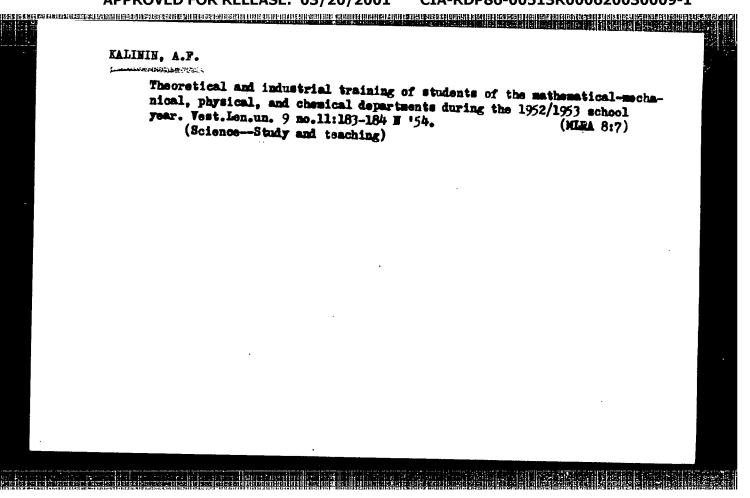
KALININ, A. D.

6827.   Kalinin, A. D. i Glembotskiy, Ya. L.
3500 kilogrammov moloka ot Kazhdoy korovy. (Opyt raboty markhin.
Podsobnogo khozyaystva Torgsevmorputi). Yakutsk, Yakutknigoizdat,
1954. 28 s. 20 sm. (M-vo sel'skogo khozyaystva yakut. ASSR. Uchastniki
Vskhv) 3.000 ekz. 30 k. - (55-2841) P   636.2.083 st (57.31)

SO: Knizhnaya Letopis' No. 6, 1955

KAL___, A. D.

5734. KAL___, A. D. Kak __y D___lis' Povyseniya __l_chnoy Produktivnosti Korov.
(Iz Opyta Markhin. Oroshe.e-_i __l_ovodcheskogo Khozyaystva Glavsever_or_ ti).
Yakutsk, Yakutknigoizdat, 1954. 235. 20sm. (Vsesoyuz. O-vo po Rasprostraneniyu
Polit. i nauch. znanty. Yakut. otd.- niyo. Uchastniki VSUV). 4.000 ekz. 2__k-MA
Yakut. YAZ-(54-57063) P. 636.2.083st (57.31).

SO: Knizhnaya, Letopis, Vol. 1, 1955

KALININ,A.F.

Students' classroom study and work experience in the depart-
ments of soil biology, geology, and geography, during the
1952-1953 school year. Vest.Len.un. 9 No.10:125-126 O '54.
(Science--Study and teaching)   (MLRA 8:7)

KALININ, A.F.

Theoretical and industrial training of students of the mathematical-mecha-
nical, physical, and chemical departments during the 1952/1953 school
year. Vest.Len.un. 9 no.11:183-184 N '54.   (MLRA 8:7)
    (Science—Study and teaching)

AUTHOR: Kalinin, A.G.   SOV-132-58-8-7/16

TITLE: Prospects of Guided Drilling on Iron Ore Deposits of the
                Gornaya Shoriya (Perspektivy napravlennogo bureniya na zhe-
                lezorudnykh mestorozhdeniyakh Gornoy Shorii)

PERICDICAL: Razvedka i okhrana nedr, 1958, Nr 8, pp 25-28 (USSR)

ABSTRACT: It is known that the drilling bit tends to take a position
                perpendicular to inclined layers of various hardness and
                in consequence the bore hole deviates from the given direc-
                tion. To obviate this phenomenon, two devices were con-
                structed, one - by Volkov and Stepanov and the other - by
                the author. Detailed description of these devices is given.
                They can be used only in cases where the zenith angles are
                not less than 8 - 10°. There are 5 diagrams.

ASSOCIATION: (MGRI)

                1. Drills--Performance   2. Drilling machines--Equipment

Card 1/1

KALININ, A.G.

Effect of the deflection of holes on power expenditure in drill-
ing. Izv.vys.ucheb.zav.; geol.i razv. 1 no.9:130-135 S '58.
(MIRA 12:9)

1. Moskovskiy geologorazvedochnyy institut im. S.Ordzhonikidze,
Kafedra razvedochnogo bureniya.
(Boring)

KALININ, A. G.

Engineers G. A. Agranoskiy, N. M. Levitanskaya, A. G. Kalinin (NIIAvtoprom), G. Ye. Litvin, A. A. Bulatnikov (Automobile Works imeni Likhachev) were awarded the First N. A. Minkevich Prize for the paper "Investigation and Introduction of a Standard, Controlled Atmosphere for Heat Treatment and Chemical-Heat Treatment of Steel", wherein these authors propose an original method of purification of town gas by passing it through zinc-chromium catalsts.

Results of the 1958 Competition for Obtaining imeni D. K. Chernov and imeni N. A. Minkevich Prizes, Metallovedeniye i termicheskaya obrabotka metallov, 1959, No. 6, pp 62-64

KALININ, A.G.

Improving methods for measuring crooked holes. Trudy MORI 34:145-148 '59. (MIRA 13:12)

(Boring)

KALININ, A. G. Cand Tech Sci -- (diss) "Laws of the distortion of prospecting
wells in deposits of the mountainous Shoriya and methods of checking the distortion."
Mos, 1959. 12 pp (Min of Higher Education USSR. Mos Geol Prospecting Inst im
S. Ordzhonikidze), 110 copies (KL, 41-59, 104)

-25-

KALININ, A.G.

Factors determining the deflection of holes in iron ore deposits of Gornaya Shoriya. Izv.vys.ucheb.zav.; geol.i razv. 2 no.11:108-117 N '59.   (MIRA 13:6)

1. Moskovskiy geologorazvedochnyy institut im. S.Ordzhonikidze.
        (Gornaya Shoriya--Boring)

KALININ, A.G.; ANDREYEV, M.M.

Minium permissible radius of curvature of boreholes. Izv.
vys. ucheb. zav.; geol. i razv. 4 no.5:97-101 My '61.
(MIRA 14:6)
1. Moskovskiy geologorazvedochnyy institut imeni S.Ordzhonikidze.
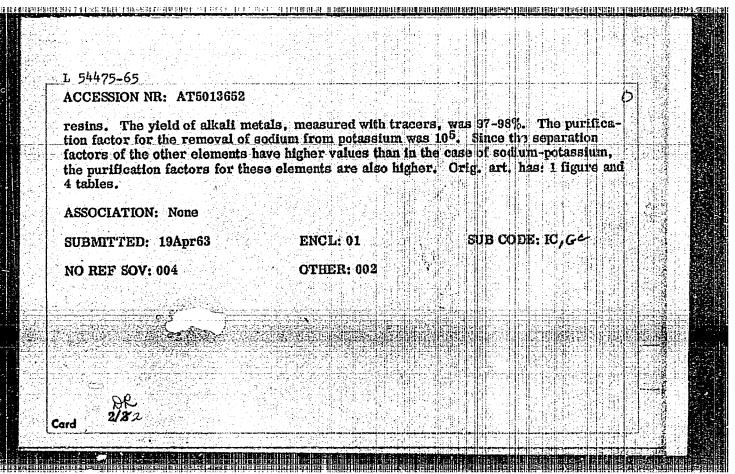(Boring) (Blasting)

VOLKOV, Aleksandr Spiridonovich; KALININ, Anatoliy Georgiyevich;
BRONZOV, Anatoliy Samsonovich. Prinimal uchastiye GRIGOR'YEV,
Yu.L., inzh.; ISAYEVA, V.V., ved. red.; POLOSINA, A.S., tekhn.
red.

[Drilling pipes and their joints; a manual] Buril'nye truby i ikh
soedineniia; spravochnoe rukovodstvo. Moskva, Gostoptekhizdat,
1962. 125 p.   (MIRA 15:7)
                    (Boring machinery)

L 54475-65   EWG(j)/EWT(m)/EPF(c)/EWG(m)/EPR/EWP(t)/EWP(b)   Pr-4/Ps-4/Peb
DIAAP/IJP(c)   RWH/JD/JG/GS/RM
ACCESSION NR: AT5013652   UR/0000/65/000/000/0118/0171
                                            543.53:546.284

AUTHOR: Zasukhin, E. N.; Kalinin, A. E.; Kuznetsov, R. A.; Moiseyev, V. V.

TITLE: Radioactivation analysis of silicon dioxide by means of ion exchange chromato-
graphy. Part 2. Separation and determination of alkali metals

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Radiokhimicheskiye
metody opredeleniya mikroelementov (Radiochemical methods for determining trace
elements); sbornik statey. Moscow, Izd-vo Nauka, 1965, 168-171

TOPIC TAGS: column chromatography, radioactivation analysis, silica analysis,
zirconium tungstate, alkali metal separation

ABSTRACT: A procedure was developed for the separation of sodium, potassium,
rubidium, and cesium on zirconium tungstate sorbent (see Fig. 1 of the Enclosure) in-
volving an activation determination of the impurities in silicon dioxide of high purity.
Radioactive tracers were used to determine the partition coefficients of alkali metal ions
for the sorbent in ammonium chloride solutions of various concentrations; from these
values, the separation factors of alkali metals were calculated. It was found that alkali
metals are separated much better on zirconium tungstate than on organic ion-exchange
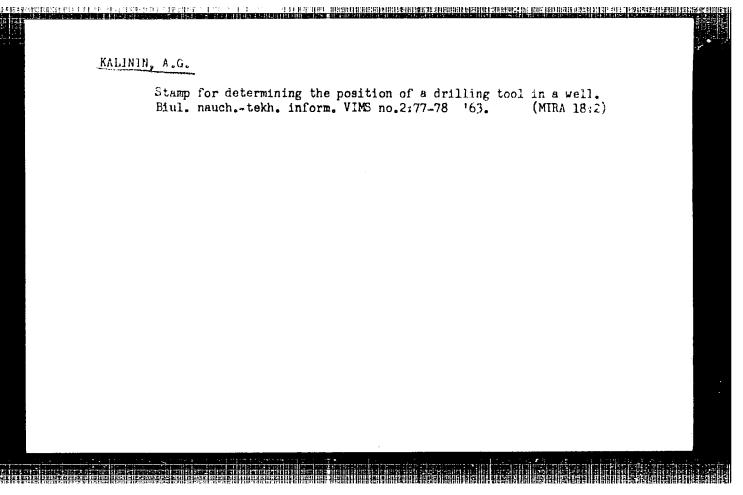
Card 1/2

L 54475-65

ACCESSION NR: AT5013652

resins. The yield of alkali metals, measured with tracers, was 97-98%. The purifica-
tion factor for the removal of sodium from potassium was 10^5. Since the separation
factors of the other elements have higher values than in the case of sodium-potassium,
the purification factors for these elements are also higher. Orig. art. has: 1 figure and
4 tables.

ASSOCIATION: None

SUBMITTED: 19Apr63   ENCL: 01   SUB CODE: IC, GC

NO REF SOV: 004   OTHER: 002

Card

KORNEV, A. M.; KALININ, A. G.; LARIN, Yu. M.

        Controlled inclined drilling of prospecting holes with small
        turbodrills. Razved. i okh. nedr 28 no.6:24-27 Je '62.
                                        (MIRA 15:10)

        1. Moskovskiy institut neftekhimicheskoy i gazovoy promysh-
        lennosti im. akad. Gubkina (for Kornev). 2. TSentral'noye
        konstruktorskoye byuro Ministerstva geologii i okhrany nedr
        SSSR (for Larin).

                      (Turbodrills)

KALININ, A.G.

Stamp for determining the position of a drilling tool in a well.
Biul. nauch.-tekh. inform. VIMS no.2:77-78 '63.   (MIRA 18:2)

KALININ, Anatoliy Georgiyevich; VASIL'YEV, Yuriy Sergeyevich; BRONZOV,
    Anatoliy Samsonovich; SIVOKHINA, N.B., red.; LATUKHINA, Ye.I.,
    ved. red.; POLOSINA, A.S., tekhn. red.   . . -

[Orienting deflecting drilling systems] Orientirovanie otklo-
niaiushchikh sistem v skvazhinakh. Moskva, Gostoptekhizdat,
1963. 149 p.   (MIRA 16:10)
            (Boring)

VASIL'YEV, Yuriy Sergeyevich; SIVOKHINA, Nataliya Borisovna;
    BRONZOV, Anatoliy Samsonovich; KALININ, A.G., red.;
    LATUKHINA, Ye.I., ved. red.; VORONOVA, V.V., tekhn.red.

[Tolerable declination of boreholes from the design] Dopu-
stimye otkloneniia stvolov skvazhin ot proekta. Moskva,
Gostoptekhizdat, 1963. 152 p.   (MIRA 16:10)
    (Boring)   (Tolerance (Engineering))

KALININ, Anatoliy Georgiyevich; VOZDVIZHENSKIY, B.I., red.; LATUKHINA,
Ye.I., ved. red.; VORONOVA, V.V., tekhn. red.

[Deflection of boreholes] Iskrivlenie burovykh skvazhin. Mo-
skva, Gostoptekhizdat, 1963. 307 p.   (MIRA 16:11)
                    (Boring)

VASIL'YEV, Yu.S.; KALININ, A.G.; POPOV, V.M.

Effect of deflecting force on the extent of well deflection.
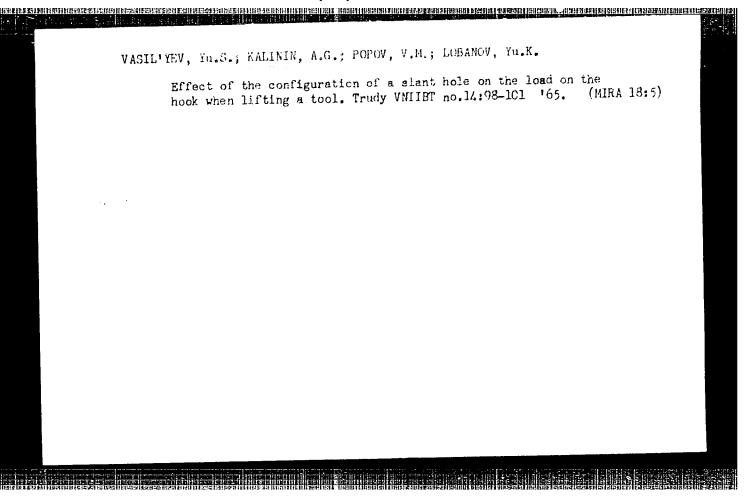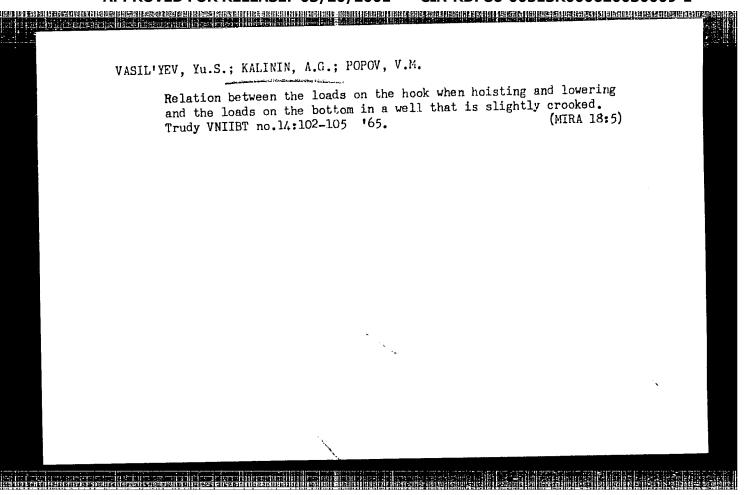Trudy VNIIBT   no.10:88-92 '63.   (MIRA 17:4)

ARONOV, Yu.A.; VASIL'YEV, Yu.S.; KALININ, A.G.

Using turbine whipstocks. Burenie no.5:21-23 '64.   (MIRA 18:5)

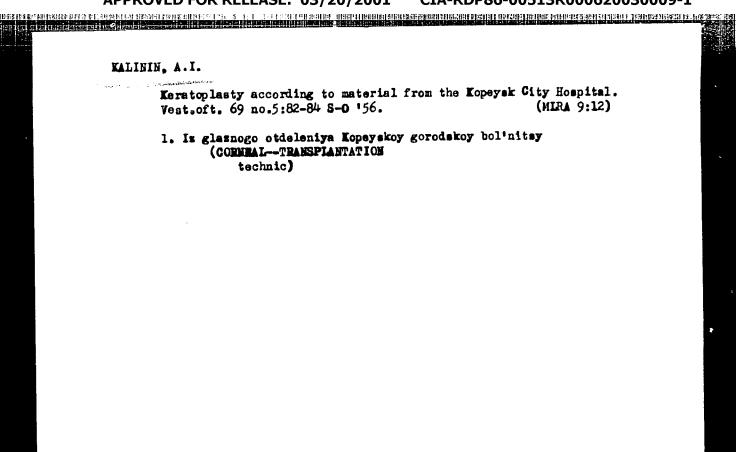1. Vsesoyuznyy nauchno-issledovatel'skiy institut burovoy tekhniki.

V. ARSENIY, ...

Using plastics to control circulation loss and water inflow
in oil well drilling. Izv. vys. ucheb. zav.; nef. i gaz. 7
no.9:114-12. S '64. (MIRA 17:10)

1. Rossiyskiy geologorazvedochnyy institut imeni Ordzhonikidze.

VASIL'YEV, Yu.S.; KALININ, A.G.; POPOV, V.M.; LOBANOV, Yu.K.

Effect of the configuration of a slant hole on the load on the
hook when lifting a tool. Trudy VNIIBT no.14:98-101 '65.   (MIRA 18:5)

VASIL'YEV, Yu.S.; KALININ, A.G.; POPOV, V.M.

Relation between the loads on the hook when hoisting and lowering
and the loads on the bottom in a well that is slightly crooked.
Trudy VNIIBT no.14:102-105 '65.   (MIRA 18:5)

KALININ, A.I.

Rapid traction test of tractors. Avt. i trakt. prom. no.5:31-33 My '57.
(MIRA 10:6)

1. Nauchno-issledovatel'skiy avtotraktornyy institut.
(Tractors--Testing)   (Dynamometer)

KALININ, A. I.

KALININ, A. I.   "Variations in intra-eye pressure in blood donors after having given blood", Trudy Smol. gos. med. in-ta, Vol. II, 1948, p. 2.6-89.

SO: U-4393, 19 August 53, (Letopis 'Zhurnal 'nykh statey', No. 22, 1949).

KALININ, A.I.

Keratoplasty according to material from the Kopeysk City Hospital.
Vest.oft. 69 no.5:82-84 S-O '56.   (MIRA 9:12)

1. Iz glaznogo otdeleniya Kopeyskoy gorodskoy bol'nitsy
    (CORNEAL--TRANSPLANTATION
        technic)

KORSHUNOV, I.A.; KALININ, A.I.

Polarography in organic analysis (survey). Zav.lab. 27 no.11:1323-
1328 '61. (MIRA 14:10)
(Polarography)   (Chemistry, Organic---Analysis)

GRECHEV, M.A., kand. ekon. nauk; KLESMET, O.G., kand.ekon. nauk;
TARASOV, K.S., kand. ekon. nauk; DANILEVICH, M.V.,
doktor ekon. nauk; YURLOV, A.F., kand.ekon. nauk;
ONUFRIYEV, Yu.G.; ROMANOVA, Z.I., kand. ekon. nauk;
SHEREMET'YEV, I.K., kand. ekon. nauk; SHUL'GOVSKIY,
A.F., kand. istor. nauk; KALININ, A.I., kand. iurid. nauk;
AVARINA, V.Ya., doktor ekon. nauk, red.; BAYKOV, V.S.,red.;
KOVALEV, A.P., red.izd-va; KASHINA, P.S., tekhn. red.

[Econonomic problems of Latin American countries] Ekonomi-
cheskie problemy stran Latinskoi Ameriki. Moskva, Izd-vo
AN SSSR, 1963. 511 p.   (MIRA 17:1)

1. Akademiya nauk SSSR. Institut mirovoy ekonomiki i mezh-
dunarodnykh otnosheniy.

5 (3)
AUTHORS: Korshunov, I. A., Vodzinskiy, Yu. V.   SOV/79-29-4-69/77
                Vyazankin, N. S., Kalinin, A. I. (*Yor kiy*)

TITLE: The Reduction of the Derivatives of the α, β-Unsaturated Acids
                on the Mercury Drop Cathode (Vosstanovleniye na rtutnom kapel'-
                nom katode proizvodnykh α, β-nenasyshchennykh kislot).
                I) Derivatives of the Fumaric Acid (I.Proizvodnyye fumarovoy
                kisloty)

ABSTRACT: The problem of the influence of the structure of organic com-
                pounds on their reducibility on the mercury drop cathode was
                often discussed in the publications, the views were, however,
                conflicting (e. g. Refs 1,2). As far as the reactivity of the
                molecule is determined by the nature of its atoms and the cha-
                racter of the bonds between the atoms, by its polarity and po-
                larization capacity as well as by other factors, it is obvious
                that only an investigation of all these factors may yield a
                judgment concerning the easiness of its reduction. Since the
                problem of the influence of the structure of organic compounds
Card 1/3

The Reduction of the Derivatives of the α, β-Unsaturated   SOV/79-29-4-69/77
Acids on the Mercury Drop Cathode.
I) Derivatives of the Fumaric Acid

on the reducibility is important the authors considered it to
be natural to determine the dependence of the half cycle poten-
tial of the reduction on the conjugation character in the α, β-
-unsaturated acids and its derivatives. For this purpose the
polarographic reduction of a series of derivatives of fumaric
acid was investigated. Many authors (Refs 3-5) dealt with the
reduction of the fumaric- and maleinic acid, their esters and
salts on the mercury cathode. These authors determined the
potential values and the number of the electrons taking part in
the reduction. The data of M. I. Bobrova and A. N. Matveyeva
(Ref 6) concerning the reduction of dinitrile of fumaric acid
at the mercury drop cathode did not agree with those of the
authors, since the authors had no pure products. Hitherto un-
known derivatives of the fumaric acid were obtained and charac-
terized: amide, dimethyl amide, diethyl amide, dibutyl amide,
diphenyl amide, and the nitrile of β-carbethoxyacrylic acid.
The dimethyl- and monoethyl ester, the diamide and dinitrile
of fumaric acid as well as the given derivatives of β-carbe-
Card 2/3   thoxyacrylic acid were subjected to a polarographic investiga-

The Reduction of the Derivatives of the α, β-Unsaturated   SOV/79-29-4-69/77
Acids on the Mercury Drop Cathode.
I) Derivatives of the Fumaric Acid

tion. **Ease of reduction diminishes in the**
series: diphenyl amide⟩ amide⟩ dimethyl amide⟩ diethyl amide⟩
dibutyl amide of β-carbethoxyacrylic acid which is completely
in line with the character of the conjugated system of the
π-bonds in these compounds. There are 1 figure, 1 table, and
12 references, 5 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom go-
sudarstvennom universitete (Scientific Research Institute of
Chemistry of Gor'kiy State University)

SUBMITTED: January 24, 1958

Card 3/3

L 54474-65   EWG(j)/EWT(m)/EPF(c)/EWG(m)/EPR/EWP(t)/EWP(b)   Pr-4/Ps-4/Peb
DIAAP/IJP(c)   RWH/JD/GS/RM

ACCESSION NR: AT5013651   UR/0000/65/000/000/0161/0167
                               543.53:546.284

AUTHOR: Kalinin, A. I.; Kuznetsov, R. A.; Moiseyev, V. V.; Tsepurnek, V. E.

TITLE: Radioactivation analysis of silicon dioxide by means of ion exchange chromatography. Part 1. Group separation of microimpurities followed by Gamma-spectrometric determination.

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Radiokhimicheskiye metody opredeleniya mikroelementov (Radiochemical methods for determining trace elements); sbornik statey. Moscow, Izd-vo Nauka, 1965, 161-167

TOPIC TAGS: column chromatography, radioactivation analysis, silicon analysis, Gamma spectroscopy

ABSTRACT: The authors propose a method for the rapid chromatographic separation of elements activated by activation analysis into groups; this is followed by a v-spectrometric analysis of the isolated fractions. The method was applied to the radioactivation determination of trace impurities in silicon dioxide of high purity. Resins AV-17 and KU-2 were used for the separation. The following elements were determined: K, Na, Rb, Cs, Ca, Sr, Ba, Cu, Co, Ga, Zn, In, Cd, Sb, Ta, Mo, Sn, As, P, W, Ni, Cr, Au. The method has several

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L 54474-65

ACCESSION NR: AT5013651

advantages: (1) the separation is made in small volumes (0.1-0.5 ml) and with small chromatographic columns, so that the duration of the analysis is considerably reduced; (2) since the final determination is γ-spectrometric, no thorough radiochemical purification of the separated fractions is required; (3) the method permits the determination of a large number of elements as compared to the γ-spectrometric method involving no decomposition of the sample; the elements in the separated groups are selected in such a way that the interfering influence of some radioisotopes on others is eliminated during the recording of ____chromatographic separation permits the separation of ela-

determination ... isotopes can then be measured with a b-counter. A description of the whole analytical procedure is given. Orig. art. has: 7 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 19Apr63

NO REF SOV: 002

ENCL: 00

OTHER: 003

SUB CODE: IC, GC

Card 2/2

L 54476-65   EWG(j)/EWT(m)/EPF(c)/EWG(m)/EPR/EWP(t)/EWT(b)   Pr-4/Pa-4   DIAAP/
IJP(c)   RWH/JD/GS/RM
ACCESSION NR: AT5013653   UR/0000/65/000/000/0171/0176
543.53 + 66.074:546.284

AUTHOR: Kalinin, A. I.; Kuznetsov, R. A.; Moiseyev, V. V.

TITLE: Radioactivation analysis of silicon dioxide by means of ion exchange chromato-graphy. Part 3. Separation of elements on an anion exchanger in the Cl- and OH- forms

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Radiokhimicheskiye metody opredeleniya mikroelementov (Radiochemical methods for determining trace elements); sbornik statey. Moscow, Izd-vo Nauka, 1965, 171-176

TOPIC TAGS: column chromatography, anion exchange resin, radioactivation analysis, silica analysis, gamma spectroscopy

ABSTRACT: Considering the limitations of a final γ-spectrophotometric determination, the authors propose a procedure for the chromatographic separation of two groups of elements into the individual elements, followed by measurement of the activity of these elements with an end-window counter. The two groups include: (1) Co, Cu, In, Fe, Ga, Zn, Cd, and (2) Mn, Ag, Ni, Cr, and the rare earths. The separation is performed in the same columns which were used previously to separate these groups of elements in the course of the group separation of trace impurities. The sensitivity of the determination is

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L 54476-65

ACCESSIONNR: AT5013653

approximately one degree of magnitude higher than in the case of a final γ-spectrometric determination. The degree of separation of the elements was measured on artificial mixtures with radioactive tracers. The metals Cu, Co, Cd, Zn, In, Ga, and Fe were separated on the AV-17x8 resin in the Cl⁻form, and Mn, Ag, Ni, Cr and the rare earths were separated on the hydroxylated form of this resin. The procedures described are convenient for a rapid separation of elements during the radioactivation determination of trace impurities in silicon dioxide. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 25Oct63

ENCL: 00

SUB CODE: IC, GC

NO REF SOV: 003

OTHER: 004

Card   2/2

KALININ, A.I.

KARPENKO, V.L.; KALININ, A.I., inzhener.

Use of pipe condensers for cooling hydrogen used in moisture extraction. Masl. -zhir.prom 19 no.2:36-38 '54. (MLRA 7:4)

1. Zaporozhskiy zhirkombinat.
        (Hydrogenation) (Refrigeration and refrigerating machinery)

KAMINSKIY, N.A., inzh.; ARUTYUNYAN, N.S., inzh.; KALININ, A.I., inzh.

Neutralization of fats and oils in a water-alkali medium. Masl.-
zhir.prom. 26 no.12:16-18 D '60.   (MIRA 13:12)

1. Zaporozhskiy maslozhirovoy kombinat.
                    (Oils and fats)

KAMINSKIY, N.A., kand.tekhn.nauk; ARUTYUNYAN, N.S., inzh.;
KALININ, A.I., inzh.; KOZDOBA, A.A., inzh.; DMITRIYEVA, N.A., inzh.
YUDINA, T.N., inzh.

Neutralization of fats and oils in an alkali in neutralization
chambers. Masl. - zhir. prom. 27 no.12:37-40 D '61.

(MIRA 14:12)

1. Zaporozhskiy maslozhirovoy kombinat.
(Oils and fats)

KAMINSKIY, N.A., kand.tekhn.nauk; ARUTYUNYAN, N.S., inzh.;
KALININ, A.I., inzh.; KOZDOBA, A.A., inzh.;
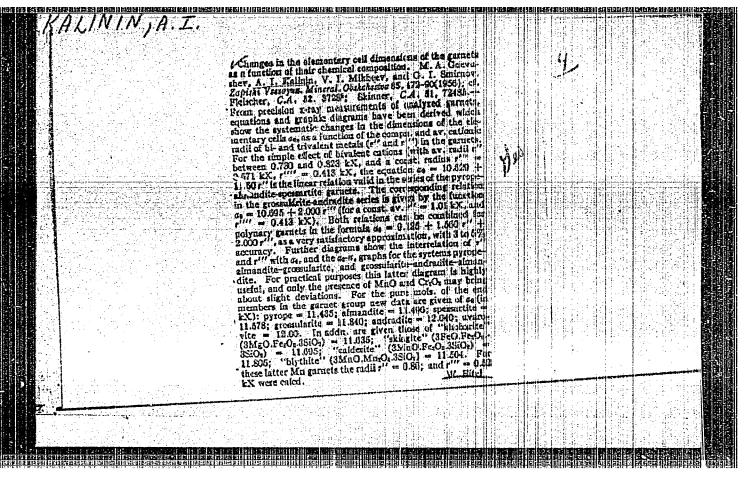DMITRIYEVA, N.A., inzh.; YUDINA, T.N., inzh.

Neutralization of fats and oils in an alkaline medium.
Masl.-zhir.prom. 28 no.7:13-14 Jl '62.   (MIRA 15:11)

1. Zaporozhskiy maslozhirovoy kombinat.
                         (Oils and fats)

KALININ, A. I.

Changes in the elementary cell dimensions of the garnets as a function of their chemical composition. M. A. Gnevu-shev, A. I. Kalinin, V. I. Mikheev, and G. I. Smirnov. *Zapiski Vsesoyuz. Mineral. Obshchestva* 85, 473–80(1956); cf. Fleischer, C.A. 52. 3728f; Skinner, C.A. 51. 7248h.— From precision x-ray measurements of analyzed garnets, equations and graphic diagrams have been derived which show the systematic changes in the dimensions of the elementary cells a_0, as a function of the compn. and av. cationic radii of bi- and trivalent metals (r'' and r''') in the garnets. For the simple effect of bivalent cations (with av. radii r''' between 0.730 and 0.823 kX, and a const. radius $r''' = 0.671$ kX, $r'''' = 0.413$ kX, the equation $a_0 = 10.820 + 11.50 r''$ is the linear relation valid in the series of the pyrope-almandite-spessartite garnets. The corresponding relation in the grossularite-andradite series is given by the function $a_0 = 10.695 + 2.000 r'''$ (for a const. av. $r'' = 1.01$ kX, and $r'''' = 0.413$ kX). Both relations can be combined for polynary garnets in the formula $a_0 = 0.126 + 1.600 r'' + 2.000 r'''$, as a very satisfactory approximation, with 3 to 6% accuracy. Further diagrams show the interrelation of r'' and r''' with a_0, and the a_0–r, graphs for the systems pyrope-almandite-grossularite, and grossularite-andradite-almandite. For practical purposes this latter diagram is highly useful, and only the presence of MnO and Cr₂O₃ may bring about slight deviations. For the pure mols. of the end members in the garnet group new data are given of a_0 (in kX): pyrope = 11.435; almandite = 11.490; spessartite = 11.578; grossularite = 11.840; andradite = 12.040; uvarovite = 12.00. In addn. are given those of "khibarite" (3MgO.Fe₂O₃.3SiO₂) = 11.035; "skiaglte" (3FeO.Fe₂O₃.3SiO₂) = 11.695; "calderite" (3MnO.Fe₂O₃.3SiO₂) = 11.504. For "blythite" (3MnO.Mn₂O₃.3SiO₂) = 11.805; these latter Mn garnets the radii $r'' = 0.80$; and $r'''' = 0.42$ kX were calcd.

M. Ettel

Kalinin, A I

MIKHEYEV, N.I. [deceased]; KALININ, A.I.

Using radiometric method in examining mineralogical composition of
meteorites. Meteoritika no.15:156-179 '58.   (MIRA 11:4)
        (Meteorites) (Radiography)

SHAFRANOVSKIY, I.I., prof. Prinimali uchastiye: MOKIYEVSKIY, V.A.; STULOV,
N.N.; GENDELEV, S.Sh.; PIS'MENNYY, V.A.; BALASHOVA, M.N.; MIKHEYEVA,
I.V.; SAL'DAU, E.P.; KALININ, A.I.; DOLIVO-DOBROVOL'SKAYA, G.M.
PIOTROVSKIY, G.L., dotsent, otv.red.; FURMAN, K.P., red.; MALYAVKO,
A.V., tekhred.

[Lectures on the morphology of mineral crystals] Lektsii po kristal-
lomorfologii mineralov. L'vov, Izd-vo L'vovskogo univ., 1960.
161 p.   (MIRA 14:1)

1. Kafedra kristallografii Leningradskogo gornogo instituta (for
Mokiyevskiy, Stulov, Gendelev, Pis'mennyy, Balashova, Mikheyeva,
Sal'dau, Kalinin, Dolivo-Dobrovol'skaya).
    (Minerals)   (Crystals)
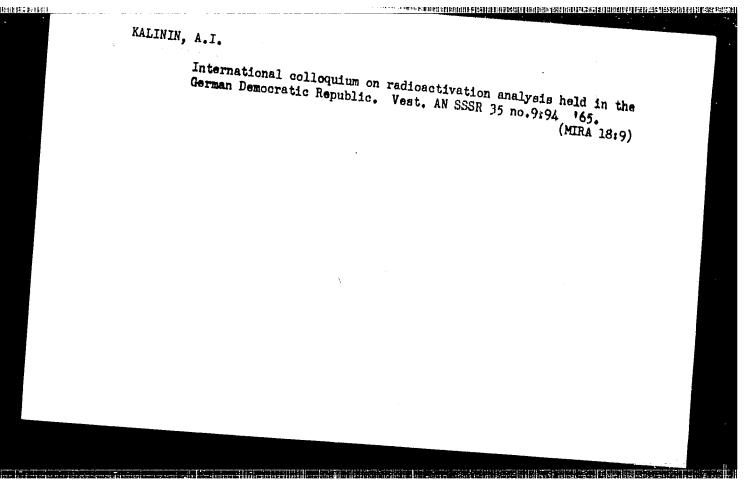
MIKHEYEV, V.I. [deceased]; KALININ, A.I.

Correlation of the magnetic properties, the specific weight, and the parameters of the elementary cell of ilmenites, Zap. LGI 38 no.2: 73-98 '61.   (MIRA 15:1)

(Ilmenite)

MIKHEYEV, V.I. [deceased]; KALININ, A.I.; SAL'DAU, E.P.

X-ray study of platinum from the Noril'sk deposit. Zap, LGI 38
no.2:99-106 '61.   (MIRA 15:1)
                (Noril'sk region--Platinum)
                (X-rays--Industrial applications)

L 55891-65   EWT(1)/FCC—GW

ACCESSION NR: AR5014436   UR/0169/65/000/005/B010/B010
                                          551.508.2

SOURCE: Ref. zh. Geofizika, Abs. 5B81

AUTHOR: Avdeyev, A.I.; Fridzon, M.B.; Kalinin, A.I.

TITLE: Some methods and results of experimental investigations of sensors of meteorological elements

CITED SOURCE: Ref. zh. Geofizika, Abs. 5B81

TOPIC TAGS: meteorological instrument, thermometer design, resistance thermometer, radiation error, atmospheric temperature

TRANSLATION: Platinum resistance thermometers of both framework and openwork types have been developed. The thermometer is designed for balloon sounding of the atmosphere. It is manufactured from platinum wire 0.03-0.05 mm in diameter. The sensing element is attached by a capron filament to a silvered steel frame constructed of wire 2 mm in diameter. Tests have shown that at a height of about 3,000 m the radiation error has a value of about 0.3-0.4C and the thermal inertia is 0.2 sec. The thermometer readings are recorded by a measuring instrument, the basis of which is a bridge circuit

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L 55891-65
ACCESSION NR: AR5014436

and a highly sensitive oscillograph with photorecording. A step-by-step switch, through a system of relays, ensures the alternate switching of the sensors and the control resistances. The sensitivity of the circuit is 3 µamps per 1C. The interrogation rate is two sensors per second. The total weight of the measuring apparatus is 3.5 kg.
M. Kaganov

SUB CODE: ES   ENCL: 00

Card 2/2

KALININ, A.I.

International colloquium on radioactivation analysis held in the German Democratic Republic. Vest. AN SSSR 35 no.9:94 '65.

(MIRA 18:9)

PAL'MOV, Ye.V., prof., doktor tekhn.nauk; KALININ, A.I., inzh.;
KOLSHUNOV, Ye.A., assistent; MAIMOV, N.I., assistent;
PETROV, I.N., assistent

Experimental investigation of the No. 1 shears of the No.3 blooming
mill at the Magnitogorsk Metallurgical Combine. Trudy Ural.politekh.
inst. no.101:21-32 '60.
    (Rolling mills)   (Shears (Machine tools))   (MIRA 14:3)

PAL'MOV, Ye. V., doktor tekhn. nauk, prof.; BALMOV, N. I., kand. tekhn. nauk, assistent; KORSHUNOV, Ye. A., kand. tekhn. nauk, assistent; PETROV, I. N., kand. tekhn. nauk, assistent; KALININ, A. I., inzh.

Developing and investigating new conditions of cutting with the shears of blooming mill No. 3 at the Magnitogorsk Metallurgical Combine. Trudy Ural'. politekh. inst. no.119:22-27 '62.

(MIRA 16:1)

(Magnitogorsk—Rolling mills)
(Shears(Machine tools))

KALININ, A.I., inzh.

Conditions of cutting hot blanks with blooming mill shears.
Met. i gornorud. prom. no.6:59-61 N-D '62.   (MIRA 17:8)

1. Nizhnetagil'skiy metallurgicheskiy kombinat.

SHALAYEV, Viktor Vasil'yevich; KALININ, Aleksandr Ivanovich; KOLBIN,
          Anatoliy Ivanovich; MEREKIN, Boris Vasil'yevich; FEYGIN,
          Geshel' Davidovich; VINOKUROV, Izrail Yakovlevich; SKAKUN,
          Vladimir Vasil'yevich; KAPUSTIN, Arkadiy Ivanovich;
          MOGILEVSKIY, David Markovich; ALEKSEYEVA, Tat'yana Alekseyevna;
          BABAYLOV, Finopent Ivanovich; SKRYABIN, N.P., red.; KRYZHOVA,
          M.L., red.izd-va; KOROL', V.P., tekhn. red.

          [Improving procedures and equipment in shape rolling mills]
          Sovershenstvovanie tekhnologii i oborudovaniia v sortoprokat-
          nom tsekhe. Sverdlovsk, Metallurgizdat, 1963. 163 p.
                                                        (MIRA 16:1)
               (Rolling (Metalwork))—Equipment and supplies)

FREYDENZON, Ye.Z.; KALININ, A.I.

Rebirth of a blooming mill. Metallurg 8 no.2:27-30 F '63.
(MIRA 16:2)
1. Nizhne-Tagil'skiy metallurgicheskiy kombinat.
(Rolling mills)

MAKAYEV, S.V., kand.tekhn.nauk; STAROSELETSKIY, M.I., inzh.; KALININ, A.I., inzh.

Reorganization of the blooming mill at the Nizhniy Tagil Metallurgical Combine. Stal' 23 no.9:816-819 S '63.
(MIRA 16:10)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat.

TSERKOVNITSKAYA, I.A., KALININ, A.I., MORACHEVSKIY, Yu.V.

Amperometric titration of gallium with a cupferron
solution. Zav.lab. 26 no.7:797 '60.   (MIRA 13:7)

1. Leningradskiy gosudarstvennyy universitet im. A.A.
Zhdanova.
             (Gallium--Analysis)

KALININ, A. I., KUZZETSOV, R. A., MOISTEYEV, V. V., and MURIN, A. N.

"Determination of tracer elements in silicon dioxide through activation analysis by means of using ion-exchange chromatography"

report to be submitted for the Intl. Symposium on Pure Substances in Science and Technology, E. German Chem. Society, Dresden, E. Germany 30 Nov. - 2 Dec. 1961

S/020/61/141/001/011/021
B103/B147

AUTHORS: Kalinin, A. I., Kuznetsov, R. A., Moiseyev, V. V., and Murin,
            A. N.

TITLE: Use of ion exchange chromatography for the activation
            analysis of microimpurities in silica

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 1, 1961, 98 - 100

TEXT: The authors state that the two usual methods of determining micro-
impurities in highly pure substances (in this case SiO_2) have several
shortcomings. Therefore, they used ion exchange chromatography for
separating activated impurities in SiO_2. Advantages of this method over
the usual analytical methods: the elements to be determined can be quickly
and reliably isolated in radiochemically pure state from a complex mixture.
A quantitative separation is achieved by choosing the proper absorption
and elution conditions in ionites. The use of microcolumns (diameter
2 mm) accelerates the separation of microquantities and saves reagents.
The amounts of the elements to be separated were determined from the
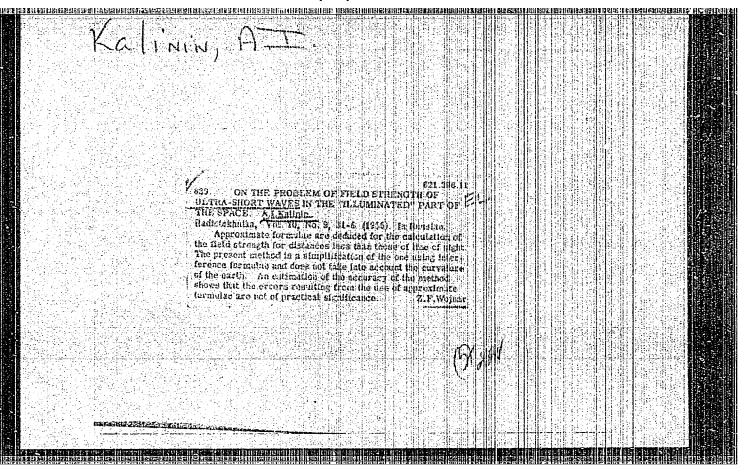
Card 1/4

Use of ion exchange chromatography...

S/020/61/141/001/011/021·
B103/B147

gold only with thiourea. The mixture of elements which were not absorbed
in the HF medium is evaporated several times together with HCl and
introduced in 90 mm long columns with AV-17 anionite in Cl⁻ form. Elements
forming negative chloride complexes are absorbed: Cu^{II}, Co^{II}, In^{III}, Ca^{III},
Zn^{II}, Cd^{II}, and Hg^{II}. Differently strong HCl is primarily used as eluant.
To improve the separation of Co from Cu, these elements are eluted
immediately after removing the non-absorbed elements with 4 N HCl. Next,
indium is eluted with 11.6 N HCl. Fe is eluted together with gallium.
Iron irradiated for a short time does not disturb the Ga determination.
If necessary, Ga and Fe are separated on a cationite. The entire
separation cycle for determining microimpurities in SiO_2 took about 4 hr
(without the time necessary for decomposing the sample). The radio-
chemical purity of the elements isolated was checked by γ-spectrophotometry
and determination of the half-life period. The study was suggested by
Yu. V. Morachevskiy. There are 3 figures, 1 table, and 5 references:
3 Soviet and 2 non-Soviet. The two references to English-language
publications read as follows: J. P. Faris, Anal. Chem. 32, No. 4, 520
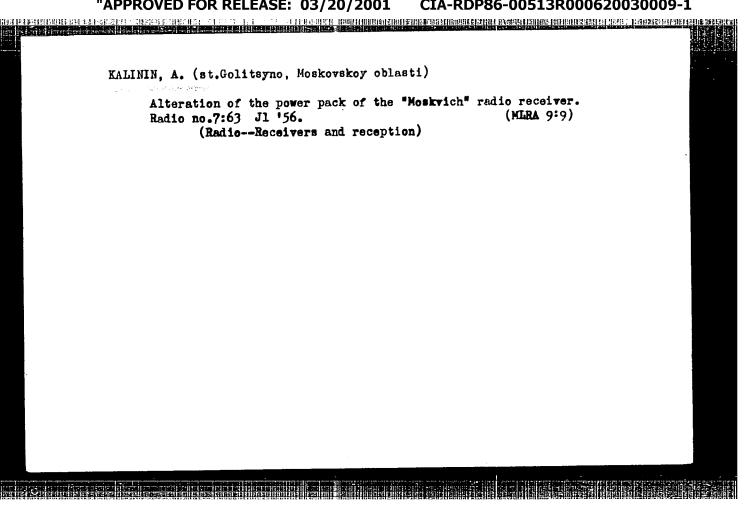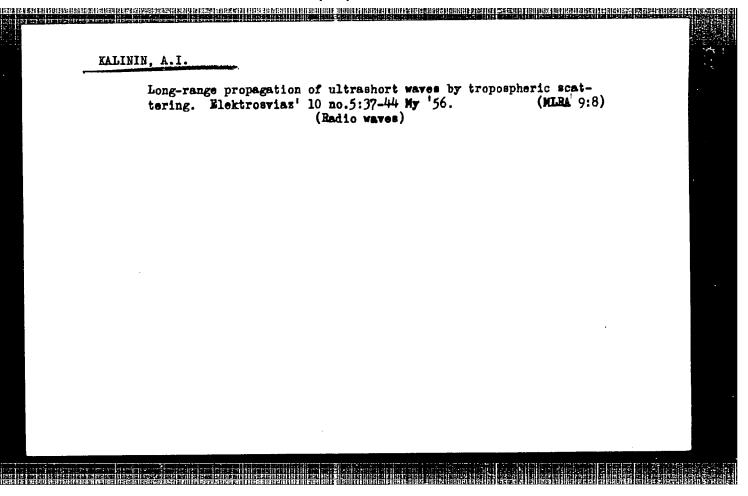(1960); K. A. Kraus, F. Nelson, Am. Soc. Testing Materials, Spec. Techn.

Card 3/4

(

KALININ, A.I.

On the possibility of reducing the depth of interferential minima in
an ultra-short-wave range in relation to the directivity of antennas.
Radiotekhnika 9 no.6:49-54 D '54.   (MIRA 8:4)
        (Radio, Short-wave)(Radar) (Antennas (Electronics))

Kalinin, A-I

629.   ON THE PROBLEM OF FIELD STRENGTH OF
ULTRA-SHORT WAVES IN THE "ILLUMINATED" PART OF
THE SPACE.   A.I.Kalinin.
Radiotekhnika, Vol. 10, No. 9, 31-6 (1946). In Russian.
   Approximate formulae are deduced for the calculation of
the field strength for distances less than those of line of sight.
The present method is a simplification of the one using inter-
ference formulae and does not take into account the curvature
of the earth.   An estimation of the accuracy of the method
shows that the errors resulting from the use of approximate
formulae are not of practical significance.   Z.F.Wojnar

621.396.11

BORODICH, S.V.; KALININ, A.I.; FORTUSHENKO, A.D., otvetstvennyy redaktor;
GRIGOR'YEV, B.S., redaktor; VEYNTRAUB, A.B., tekhnicheskiy redaktor

[Handbook for electrocommunications engineering] Inzhenerno-
tekhnicheskii spravochnik po elektrosviazi. Moskva, Gos. izd-vo
lit-ry po voprosam sviazi i radio. Vol. 7. [Radio relay systems]
Radioreleinye linii. 1956. 172 p.   (MIRA 9:9)

1. Russia (1923-   U.S.S.R.) Ministerstvo svyazi.
       (Radio relay systems)

KALININ, A. (st.Golitsyno, Moskovskoy oblasti)

Alteration of the power pack of the "Moskvich" radio receiver.
Radio no.7:63 Jl '56.   (MLRA 9:9)
        (Radio--Receivers and reception)

KALININ, A.I.

Long-range propagation of ultrashort waves by tropospheric scat-
tering. Elektrosviaz' 10 no.5:37-44 My '56.   (MLRA 9:8)
                        (Radio waves)

AID P - 4910

Subject   : USSR/Electronics

Card 1/2   Pub. 90 - 4/10

Author   : Kalinin, A. I.

Title   : Computation of field strength in shadow and semi-shadow
                regions during the propagation of ultrashort waves along
                the smooth spherical surface of the earth.

Periodical   : Radiotekhnika, 6, 43-49, Je 1956

Abstract   : The author briefly reviews the methods used in computing
                field strength of ultrashort waves along the smooth
                spherical surface of the earth. For the illuminated
                regions and for distances well beyond the optical range,
                the diffraction formula is used. Only one term is necessary
                to give the accuracy usually needed. For distances within
                optical range the curved-earth theory is applicable. For
                the shadow and semi-shadow regions computations become more
                complicated. For semi-shadow regions in particular
                graphical interpolation methods were used. The author

KALININ, A. I.

PROPAGATION

"Choice of Routes for Sections of Radio Relay Lines", by A.I. Kalinin, Elektrosvyaz', No 9, September 1957, pp 20-29.

The choice of routes for maximum line stability is considered. Formulas are given for the minimum heights of antenna towers and for the maximum lengths of line section. The effect of the terrain of the locality and of the statistical distribution of the vertical gradient of the dielectric constant of air are taken into account.

Card 1/1   - 42 -

KALININ, Anatoliy Ivanovich

"The Coherent Theory of UHF Long Distance Tropospheric Propagation,"

paper presented at the Conference on Propagation of Very Short Waves in Prague (Liblice) 10-12 November 1958.

CHERENKOVA, Yelena Lazarevna; KALININ, A.I., otvetstvennyy red.; BASHCHUK,
        V.I., red.; KARABILOVA, S.F., tekhn. red.

    [Long distance propagation of ultrashort waves] Dal'nee rasprostra-
    nenie ul'trakorotkikh voln. Moskva, Gos. izd-vo lit-ry po voprosam
    sviazi i radio, 1958. 40 p.   (MIRA 11:9)
                (Radio, Shortwave—Transmitters and transmission)

AUTHOR: Kalinin, A. I.,   Member of the Society   108-1-2/10

TITLE: On the Stability of the Field Strength in the Intervals
             of Radio-Relay Systems (Ob ustoychivosti napryazhennosti
             polya na intervalakh radioreleynykh liniy)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, Nr 1, pp. 22-28 (USSR)

ABSTRACT: The construction method for field strength stability curves
             is given. This construction is carried out according to the
             known dependence of the attenuation factor in the interval
             of the system on the vertical gradients of the dielectric
             permeability of the atmosphere and according to the
             statistical distribution of the values of this gradient for
             those climatic conditions where the interval of the system
             is located. The field strength stability curves can be
             constructed as follows: the diagram of the dependence of the
             attenuation factor on the vertical gradient of the
             dielectric atmospheric-permeability is coordinated with
             a diagram of the statistical distribution of this gradient
             in such a way that the values of the gradient at the abscissa
Card 1/3   of the first diagram coincide with the corresponding values

On the Stability of the Field Strength in the Intervals of   108-1-2/10
Radio-Relay Systems

of the gradient at the ordinate of the second diagram.-
Because of the complicated character and the multi fold-
character of the meteorologic processes which are the cause
for the changes of the field strength in the system intervals,
the problem of the correlation between these changes can be
solved only by means of special experiments. Without such
experiments only the following can be said qualitatively: In
intervals of radio-relay systems quick, deep fadings of
interference character dependent on the reflection or the
dispersion of radiowaves by the heterogeneities of the
troposphere can be regarded as independent phenomena because
of the disordered character of such fadings even in two
neighbouring intervals. The relatively slow changes of the
field strength in the intervals of the radio relay systems
are dependent on the changes of the vertical gradient of the
dielectric atmospheric - permeability, which again are
caused by the changes of the meteorological conditions in
that area. As meteorological conditions of the same kind
can be observed within rather vast areas the changes of field

Card 2/3   strength, which are dependent on the changes of the vertical

On the Stability of the Field Strength in the Intervals of   108-1-2/10
Radio-Relay Systems

gradient of the dielectric atmospheric permeability, can
not be regarded as independent phenomena. Formula (7) is
deduced. The field strength stability curves determined by
this formula are of an optimum character. This is to be
understood in the sense that with a given interval length
and a given value V_0 (value of the factor of attenuation in
decibel with a slit equal to zero) for every time percent
the fading depth will be the least. In order to picture this
optimum field strength, curves for lines of different length
for the central part of the European part of the USSR are
constructed. In ref. 2 the statistical data for the values
of the vertical gradient of the dielectric atmospheric-
permeability are given, and they are used here.
There are 8 figures, 1 table, and 3 references, 3 of which
are Slavic

SUBMITTED: April 9, 1956

AVAILABLE: Library of Congress

Card 3/3   1. Radio relay systems   2. Field strength stability-Theory

AUTHOR: Kalinin, A.I.   SOV/106-59-6-6/14
TITLE: A Coherent Theory of Long-Distance Tropospheric
            Propagation of Ultra-Short Waves (Kogerentnaya teoriya
            dal'nego troposfernogo rasprostraneniya ul'trakorotkikh
            voln)

ABSTRACT: Most works on tropospheric propagation assume either that
          the field at the receiver is due to incoherent
          dispersion by irregularities in the dielectric
          permittivity of the air, or that the field is the
          combination of waves having random amplitude and phase
          after reflection from layered tropospheric irregularities.
          The author advances a theory based on the hypothesis of
          coherent reflections from lamellar tropospheric
          irregularities and an exponential relationship between
          the dielectric permittivity and the height of the layer
          above the surface of the earth. Assumptions concerning
          turbulent air movement are not necessary and the results
          agree reasonably well with the experimental data.
          Although the relationship between the dielectric
Card 1/6   permittivity ε and the height z above the earth's
          surface has a complicated random nature, nevertheless,

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the mean value of the permittivity is given
approximately by the formula

$$\varepsilon(z) = 1 + \Delta\varepsilon_0 \exp\left(\frac{g}{\Delta\varepsilon_0} z\right) \qquad (1)$$

where $\Delta\varepsilon_0$ is the deviation of ε from unity at the
earth's surface and $g < 0$ is a constant representing
the vertical gradient of the dielectric permittivity of
the air at the earth's surface with positive refraction.
It is assumed that ε is a function of z only and
therefore surfaces having equal values of ε will form
spherical surfaces concentric with the earth's surface.
The troposphere is divided into thin layers of thickness
Δz (Fig 2), and the value of $\varepsilon(z)$ in each layer is
assumed constant.   At the boundaries the permittivity
suffers a step change of $\Delta\varepsilon$ where

$$\Delta\varepsilon = g \exp\left(\frac{g}{\Delta\varepsilon_0} z\right) \Delta z \qquad (2)$$

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The layers are numbered 1,2,3,..... and the first layer
is taken at the height z_0 corresponding to the point of

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intersection of the tangents to the earth's surface from
the transmitter and receiver points A and B (Fig 2).
At the receiver, at any time instant, there will be an
interference pattern of waves reflected from the boundary
layers. The resulting field strength at the receiver
will be E_m .

$$E_m = \left[\left(\sum_{i=1}^{\infty} E_{mi} \cos \gamma_i \right)^2 + \left(\sum_{i=1}^{\infty} E_{mi} \sin \gamma_i \right)^2 \right]^{\frac{1}{2}} \qquad (3)$$

where E_{mi} and γ_i are the amplitude and phase
respectively of the wave reflected from the ith
boundary between the layers. To determine the field
strength the fields from all the boundary reflections are
summated. The author first determines the amplitude and
phase (Eqs (11) and (12)) of the wave reflected from the
i^{th} boundary. It is assumed that the transmitter and
receiver points are at equal heights above the earth's
surface and the antennae are identical. The direction of
maximum radiation is assumed to coincide with the
tangents from the transmitter and receiver points to the

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earth surface.   Changing the variable z to y, where
y is the height above the lowest layer, and letting
$\Delta_z \rightarrow 0$, an integral expression is obtained for the
reflections from the upper semi-space and for the
reduction factor V (Eq (22)).   The theoretical results
are compared with published experimental results:
1) Eq (22) shows the reduction factor proportional to
wavelength λ.   This is supported by the conclusions of
Staras and Weelon (Ref 3).   2) The theoretical values of
$V_{h=0} = f(R)$ (R and h as shown in Fig 2) are given in
Fig 3 by the full lines for $\lambda=300$, 30 and 10 cm and mean
values of $\Delta\varepsilon_0 = 7 \times 10^{-4}$, $g = -8 \times 10^{-3}$ 1/m.   The dotted
curves show comparable experimental data from Ref 2,
indicating reasonable agreement.   3) When the distance
R reduces to the range of the line-of-sight, the
theoretical formulae become erroneous, but under these
conditions the defraction field predominates, and the
Card   error is of no consequence.   4) Many experimental works
4/6   refer to the correlation between the mean level of the
field and the values of g and $\Delta\varepsilon_0$.   This dependence

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is clearly expressed in Eq (22).   5) The values of g and $\Delta\varepsilon_0$ depend on the climatic conditions, and hence Eq (22) accounts for the seasonal variation in the reduction factor V .

The rapid interference fading of signals is explained by random fluctuations in the value of ε relative to the exponential function of the mean value $\varepsilon(z)$.   The relation between the signal level and the angle of elevation above the horizontal plane is determined (Eq (25)).   Theoretical and experimental results from the work of Chisholm et al are compared in Fig 4, showing reasonable agreement.   The bandwidth of a four-terminal network equivalent to the troposphere is determined (Eq (35)) and the effects of the directivity of the antennae discussed.   It is concluded that the geometric-optical method employed shows that all fundamental experimental data on tropospheric propagation can be explained quantitatively and qualitatively by reflections from the semi-space with an exponential dependence $\varepsilon(z)$.

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       Although the results obtained are only approximate, the author considers that they form the basis for an attempt at a strict electrodynamic solution using the exponential law.   The author expresses thanks to Acad. B.A. Vvedenskiy.

Card 6/6   There are 4 figures and 6 references, 5 of which are English and 1 Soviet.

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KALININ, A. I., KOLOSOV, M. A., SHABELNIKOV, A. V., SHIRAY, R. A., SOKOLOV, A. V.,

VVEDENSKIY, B. A. and ARMAND, N. A.

"Long Range Tropospheric Propagation of Ultra Short Radio Waves."

report presented at Commission II, 13th General Assembly of the International
Scientific Radio Union in London, 5-15 Sept 1960.

Report available, Encl. to B-3,176,875, 30 Jan 61

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9.9000 (also 1050, 1041, 1331)

AUTHOR: Kalinin, A.I.

TITLE: The Long-Distance Tropospheric Propagation of Ultrashort Waves

PERIODICAL: Elektrosvyaz', 1960, No. 6, pp. 39 - 49

TEXT: The author discusses the basic results of an experimental study of
the long-distance tropospheric propagation of ultrashort waves. The theoretical
discussion of these results will be given in a subsequent paper. The author re-
views the history of the discovery of the tropospheric propagation of ultrashort
waves. This long-distance propagation cannot be explained by the existing dif-
fraction theory. It is assumed that ultrashort waves are reflected from nonuni-
formities in the troposphere having different dielectric constants. These non-
uniformities of the air layers are caused by thermal effects. Recordings of the
signal level during long-distance tropospheric propagation of ultrashort waves
show very rapid signal fadings (fluctuations) on the receiver side, with periods
of a fraction of a second. These fadings are caused by the multitude of waves
arriving at the receiver after having been reradiated from moving nonuniformi-
ties in the atmosphere. Based on geometric considerations, it is not difficult

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to establish that the rate of wave-phase changes is greater over longer distanc-
es; consequently, the rate of fadings must increase with the distance. Slow
changes of the signal level have periods of several hours and are caused by
changes in the meteorological conditions in the troposphere. The diurnal course
of the mean hourly values of the signal level is weakly pronounced and does not
have any definite laws. The seasonal changes of the signal level are more pro-
nounced. The mean monthly averages of the signal level are considerably higher
in summer than during winter. The difference is of the order of 12 - 25 dB. Ad-
ditional investigations are required concerning the dependence of the signal
level on the distance and the wavelength, since the available data are incomplete
in this respect. Experiments showed that the signal level is at a maximum dur-
ing long-distance tropospheric propagation of ultrashort waves, if the maxima of
the directivity patterns of the transmitter and the receiver antenna are orient-
ed in the horizontal plane along the arc of the great circle passing through the
transmission and reception points, and in the vertical plane in the direction of
the horizon. The signal level will decrease, if the maxima of the directivity
patterns will deviate from the aforementioned directions. The signal level hard-

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ly depends on the height of the antenna elevation above ground, and considerably
less than in the propagation due to diffraction along the earth's surface. Si-
multaneous measurements during long distance tropospheric propagation showed
that the mean signal level does not depend on the type of polarization. The sig-
nal fading in antennas having different polarizations proceeds practically syn-
chronously. Consequently, doubled reception with antennas of different polari-
zations will not result in a noticeable advantage in reducing the depth of fad-
ing. Some depolarization of radio waves occurs in the long-distance tropospher-
ic propagation of ultrashort waves. Signal distortions are caused by the arriv-
al of a multitude of waves having paths of various lengths, arriving for this
reason at different moments at the receiver. This difference in the time of ar-
rival can cause additional noise in multi-channel telephone communication with
frequency condensation. The signal distortions will be greater, the greater the
difference is in the time of arrival of different waves. The random character
of the reradiation of electromagnetic energy permits only a statistical determi-
nation of the distortions to be made. The presence of a correlation between the
mean values of the signal level and ϵ_o, the dielectric constant of the air near

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